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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/889,670	07/19/2001	Keith Cover	A-9185	7010

181 7590 01/14/2005

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EXAMINER	
SHARON, AYAL I	

ART UNIT	PAPER NUMBER
2123	

DATE MAILED: 01/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Applicati n No.	Applicant(s)	
	09/889,670	COVER, KEITH	
	Examiner	Art Unit	
	Ayal I Sharon	2123	

-- The MAILING DATE of this communication appears n the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 July 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☒ Claim(s) *17 and 18* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 July 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Introduction

1. Claims 1-21 of U.S. Application 09/889,670 filed on 07/19/2001 are presented for examination. This application is a 371 national stage entry of PCT/IB00/00212, with an international filing date of 01/19/2000, which claims benefit of provisional application 60/116,362.

Information Disclosure Statement

2. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper."
3. Examiner has listed, in the attached PTO-892 form, the references cited in the International Search Report of the PCT that is the parent of the instant application. References not ~~been~~ cited by the Examiner on form PTO-892 have not been considered.

Drawings

4. Figures 1 and 8 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g).

Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.121(d)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

5. Claims 17-18 objected are objected to because of the following informalities: claim 17, a method claim, and claim 18, an apparatus claim, both depend from claim 1, a computer-readable medium claim. This mixture of claim types is object to. Moreover, both claims 17-18 claim dependency from the transform operator of Claim 1, and not the computer-readable medium of claim. This ambiguity is also objected to.

Claim Rejections - 35 USC § 101

6. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

7. Claims 1-12 and 17-18 are rejected under 35 U.S.C. 101 because the disclosed invention is inoperative and therefore lacks utility. Independent Claim 1 claims a computer-readable medium containing a transform operator, yet this transform operator is inoperative unless activated by a computer. The invention claimed in claim 1 is therefore inoperative, and all dependent claims inherit this defect.
8. Claims 1-12 and 17-18 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The phrase in claim 1, "... containing a transform operator constructed to provide ..." indicates that the subsequent limitation constitutes mere intended use. Therefore, claim 1 is directed to "a computer-readable medium containing a transform operator." Claim 1 therefore consists of a preamble and an intended use - structural cooperative relationships are omitted. The lack of structural limitations places the claim in the category of non-functional descriptive matter ("mere arrangement of data" as opposed to "data structure"), which is non-statutory. All dependent claims inherit this defect. See MPEP §2106 (IV)(B)(1).
9. Claims 13-16, and 19-21 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The claims are directed to an abstract mathematical algorithm which is not implemented in the technological arts, for example, in a computer or on a computer readable medium. The claimed invention is therefore not concrete or tangible. See MPEP §2106 (A), and *In re Warmerdam*, 33

F.3d 1354, 1360, 31 USPQ2d 1754, 1759 (Fed. Cir. 1994). See also *Schrader*, 22 F.3d at 295, 30 USPQ2d at 1459.

10. Claims 13-16 and 19-20 are rejected under 35 U.S.C. 101 because the disclosed invention is inoperative and therefore lacks utility. A transform operator, in and of itself, is inoperative outside of the algorithm in which it is utilized.

Claim Rejections - 35 USC § 112

11. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

12. Claims 1-18 and 21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The term "substantially" renders the claims indefinite because the metes and bounds of "substantially" are not actually disclosed, thereby rendering the scope of the claims unascertainable. Moreover, the repeated use of the term "substantially" in the dependent claims (e.g. claim 6) compounds this defect. See MPEP § 2173.05(d).

13. Claims 1-12 and 17-18 rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The phrase in claim 1, "... containing a transform operator constructed to provide ..."

indicates that the subsequent limitation constitutes mere intended use. Therefore, claim 1 is directed to "a computer-readable medium containing a transform operator." Claim 1 therefore consists of a preamble and an intended use - structural cooperative relationships are omitted.

14. Claims 13-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 13 recites "... a plurality of coefficients are selected to produce a corresponding resolution function ..", however, it is not clear to what the resolution function corresponds to.

15. Claims 19-20 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. Claim 19 omits the method steps - structural cooperative relationships are omitted. Claim 20 inherits this defect.

16. Claim 21 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 21 recites "... to provide substantially optimal linear resolution between outputs of the transform operator and an unknown model ...", however, it is not clear it is is possible to perform such an operation with an "unknown model".

Claim Rejections - 35 USC § 102

17. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

18. The prior art used for these rejections is as follows:

19. Abramov et al., "Fast Algorithms to Search for the Rational Solutions of Linear Differential Equations with Polynomial Coefficients". Proc. of the 1991 Int'l Symposium on Symbolic and Algebraic Computation. 1991. pp.267-270. (Henceforth referred to as "**Abramov**").

20. The claim rejections are hereby summarized for Applicant's convenience. The detailed rejections follow.

21. Claims 1, 17-18, and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Abramov.

22. In regards to Claim 1, Abramov teaches the following limitations:

1. A computer-readable medium containing a transform operator constructed to provide an estimate of an unknown model with substantially optimal linear resolution.
(See Abramov, especially p.267, left column)

Examiner finds that Abramov's "unknown coefficient method" (p.267, left column) corresponds to Applicant's claimed "unknown model".

In addition, Examiner finds that Abramov's teaching that "However, the algebraic equation system obtained by the unknown coefficient method may be huge and nonlinear besides. ... This paper is concerned with some ways for such an improvement with regard to solving the linear ordinary differential equations of the form [Eq.1]."

Examiner finds that the Eq.1 of Abramov (see p.267, left column) is the discrete version of Eq.1 taught in p.9 of Applicant's specification, which Applicant refers to as "the forward problem."

Also, Examiner finds that Eq.1 of Abramov teaches the use of a "linear transform operator" as defined by the Applicant in p.9 of the specification.

23. In regards to Claim 17, Abramov teaches the following limitations:

17. A method of multiexponential signal processing, which comprises:
sampling a multiexponential signal and applying the transform operator of Claim 1 to the sampled signal.
(See Abramov, especially p.267, left column)

24. In regards to Claim 18, Abramov teaches the following limitations:

18. Apparatus for multiexponential signal processing, which comprises a signal processor that has the transform operator of Claim 1.
(See Abramov, especially p.267, left column)

25. In regards to Claim 21, Abramov teaches the following limitations:

21. A method of exponential signal processing, which comprises:
providing a sampled multiexponential signal; and
(See Abramov, especially p.267, left column)

applying the sampled multiexponential signal to a transform operator constructed to provide substantially optimal linear resolution between outputs of the transform operator and an unknown model.
(See Abramov, especially p.267, left column)

Examiner finds that Abramov's "unknown coefficient method" (p.267, left column) corresponds to Applicant's claimed "unknown model".

In addition, Examiner finds that Abramov's teaching that "However, the algebraic equation system obtained by the unknown coefficient method may be huge and nonlinear besides. ... This paper is concerned with some ways for such an improvement with regard to solving the linear ordinary differential equations of the form [Eq.1]."

Examiner finds that the Eq.1 of Abramov (see p.267, left column) is the discrete version of Eq.1 taught in p.9 of Applicant's specification, which Applicant refers to as "the forward problem."

Also, Examiner finds that Eq.1 of Abramov teaches the use of a "linear transform operator" as defined by the Applicant in p.9 of the specification.

Conclusion

26. Examiner finds that Abramov does not expressly teach the use of "a matrix having at least one row of coefficients corresponding to a resolution function", as claimed in Claim 2. Dependent claims 3-12 inherit this limitation. Independent claims 13 and 19 also refer to a "resolution function" or "linear resolution".

Correspondence Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ayal I. Sharon whose telephone number is (571) 272-3714. The examiner can normally be reached on Monday through Thursday, and the first Friday of a biweek, 8:30 am – 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kevin Teska can be reached at (571) 272-3716.

Any response to this office action should be faxed to (703) 872-9306 or mailed to:

Director of Patents and Trademarks
Washington, DC 20231

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Tech Center 2100 Receptionist, whose telephone number is (571) 272-2100.

Ayal I. Sharon

Art Unit 2123

January 4, 2005